

Lehigh Cement Company, LLC Alternative Fuels Proposal

Community Information Meeting ▪ The Queensbury Hotel ▪ February 27, 2019

LEHIGH
HEIDELBERGCEMENT Group



trust earned daily



Lehigh Hanson
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Introducing Our Team

From Glens Falls:

David Dreyer, Plant Manager

John Stephenson, Production Manager

Jana Frederick, Environmental Manager

John Aylward & Maggie Donohoe, Process Engineers

Tim Kilpeck, Safety Professional

From Our Corporate Team:

Tim Matz, Senior Director, Environmental Affairs

Adam Swercheck, Environmental Director

Victor Hays, Alternative Fuels Manager – North Region

Lehigh Cement Company, LLC – Glens Falls Plant



Our Glens Falls Plant: 125 Years of Tradition

- **Longest continuously operating gray cement plant** in the United States.
- “Glens Falls Portland Cement Company” incorporated in **1893**.
- **Celebrated 125 years** of operation in 2018
- **One of only two** cement manufacturing plants remaining in **NY**
- Part of the Heidelberg Cement Group
- **More than 90 employees** working in Glens Falls
- **800 acres** in Warren and Saratoga counties
- Manufacture **(4) cements** – T1, T2, T3, Masonry
- The “**IRON CLAD**” brand associated with the Glens Falls Plant since early 20th Century.



Our Glens Falls Plant: Small But Nimble

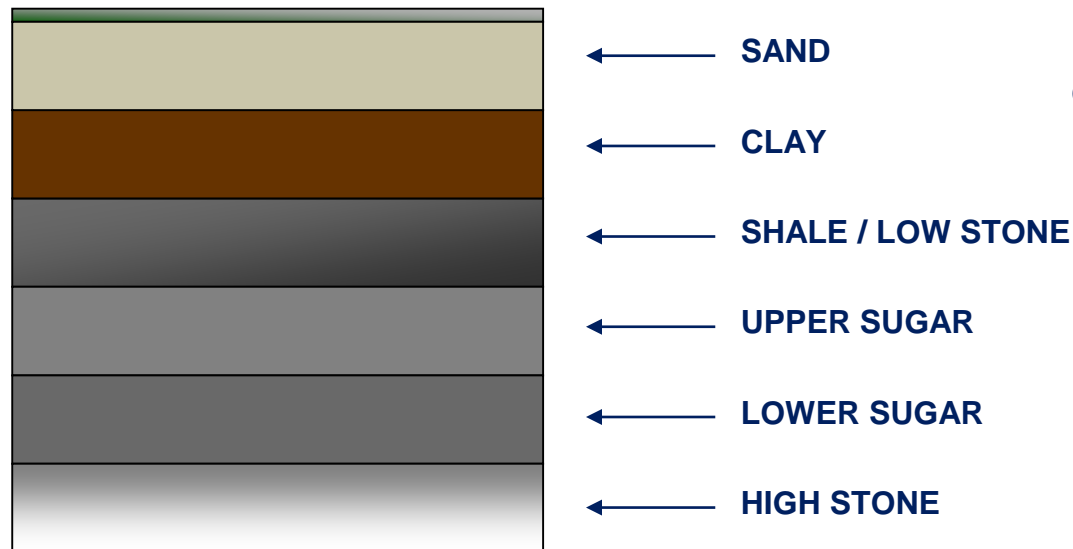


- Capacity to produce about **560,000 metric tons** of cement annually
- **Transfer +100,000 tons/year** to a sister facility in Cementon, NY (Catskill)
- **500,000 tons of cement = 60,000 homes** or a two-lane highway from Glens Falls to the Canadian Border
- Plant is small in today's world, but employees are **highly responsive to customers' needs** and we're fortunate to mine some of the **finest limestone in the world**.

“Our high-quality stone and outstanding employees are what sustains us”

Our Quarry: Some of the Finest Limestone in the World

- Located in Moreau, mined since 1920
- Approximately 335 acres
- 1906: First privately built bridge over the Hudson
- CaCO_3 Richer as Depth Increases

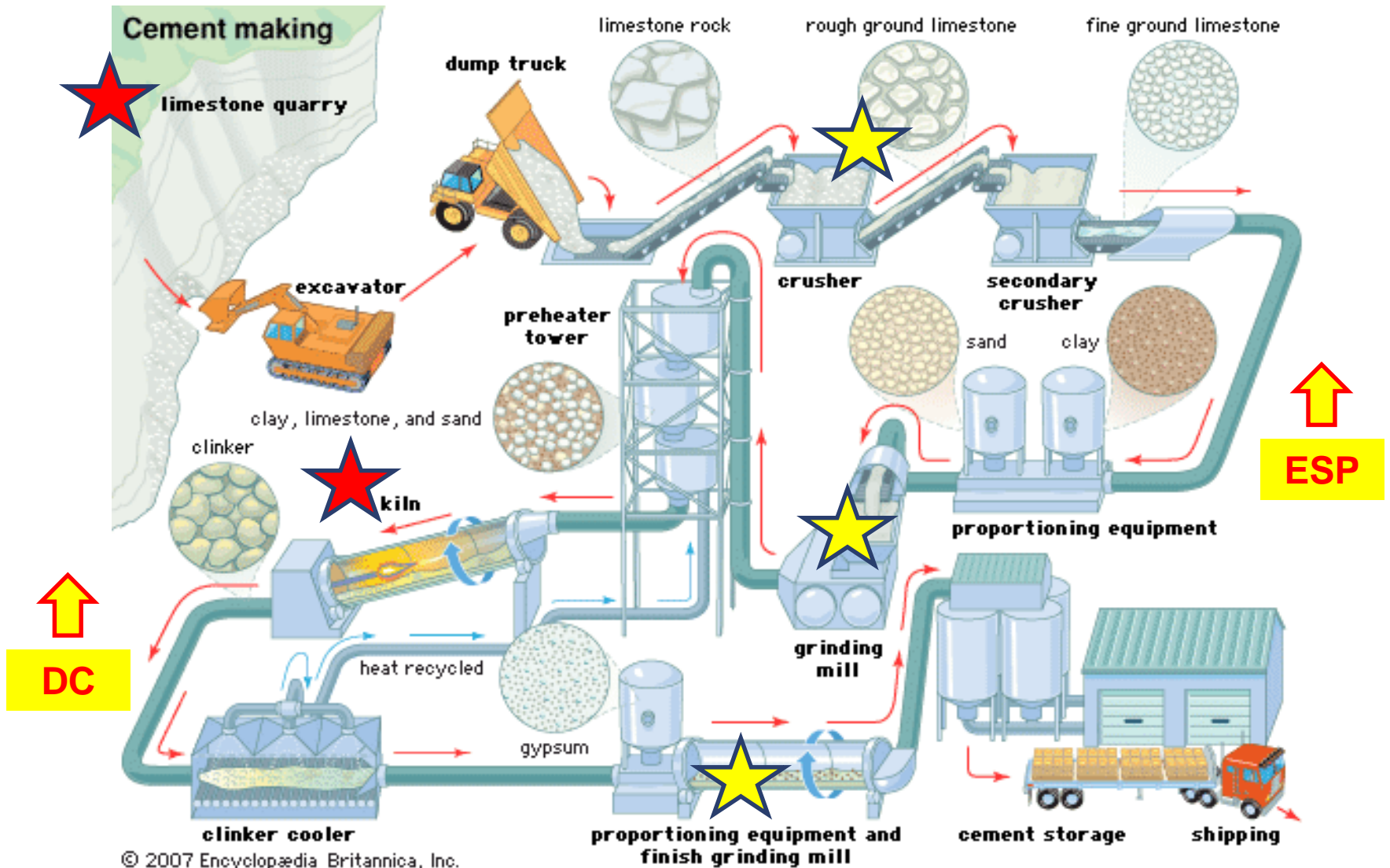


**CaO (Calcium Oxide)
concentration and therefore
hardness increases as the
quarry depth increases.**



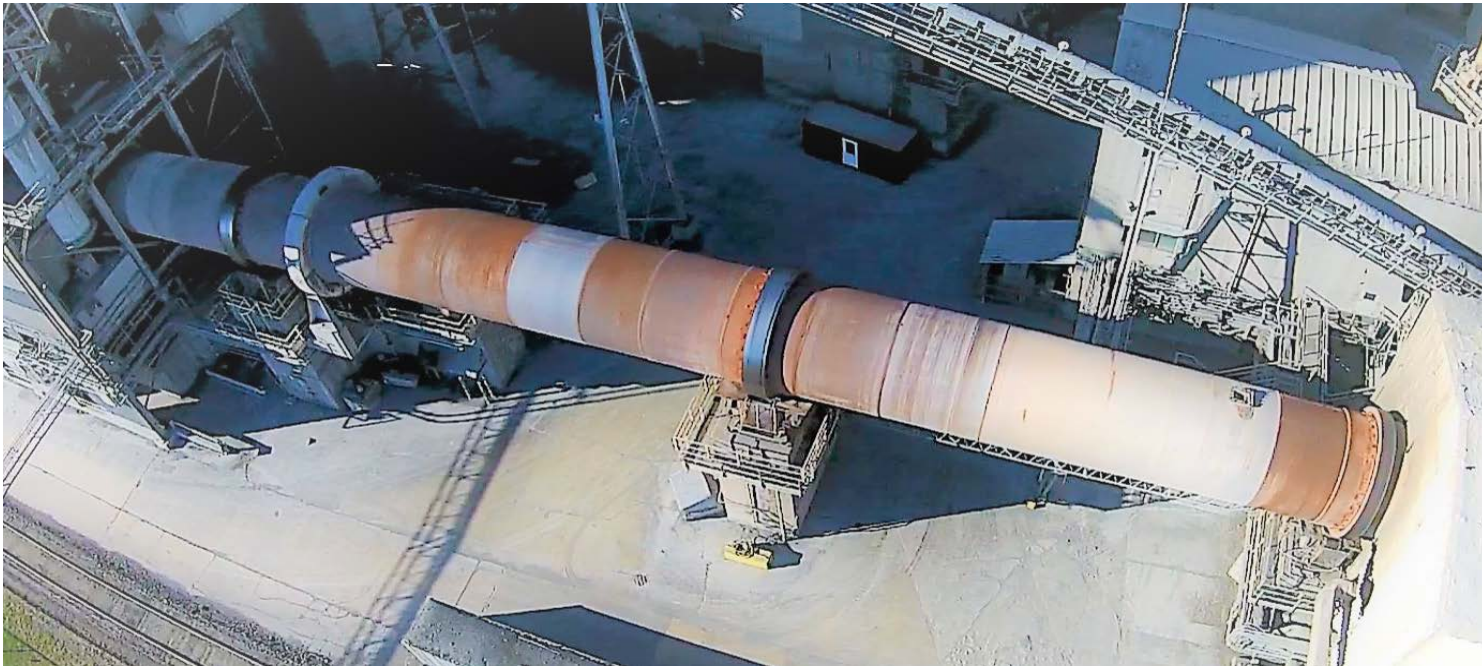
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How We Make Our Cement



Understanding Our Cement Kiln

- **204 ft. long x 14.5 ft.** inside diameter, sloped at 0.375"/ft
- May be fired using **coal** and/or **natural gas**
- Fuels must have enough BTUs to achieve **3500°F (1/3 surface temperature of sun)**
- Max rotation is 150 RPH; approx. **45 minutes** feed to discharge end



Environmental Advantages of a Cement Kiln

- 3500 deg. F flame is much higher than most industrial burners (e.g. waste-to-energy incinerators). Combined with extended residence time in kiln, this results in total destruction of fuel products. No residual ash is generated.
- Alkaline conditions inside the kiln, due to high-calcium raw mix, absorb acidic combustion products.
- Clinker absorbs physically and chemically into its structure.
- Kiln acts as large thermal sink.



Cement kilns are ideally equipped for renewable and engineered fuels.

Advanced Controls Minimize Air Emissions

- The following control devices reduce emissions:
 - ✓ Electrostatic precipitator controls Particulate Matter emissions
 - ✓ Selective Non-Catalytic Reduction system for NO_x control
 - ✓ Hydrated Lime for SO₂ control
 - ✓ Activated Carbon used to control Mercury Emissions
 - ✓ Temperature controls reduce formation of Dioxins/Furans
 - ✓ Baghouse on cooler vent controls Particulate Emissions
 - ✓ 41 Dust Collectors located throughout the facility remove PM



Current Air Emission Standards

Lehigh's air emissions are strictly regulated by the federal and state governments based on what they have determined to be protective of human health and the environment.

In 2015 ...

1. USEPA enacted stringent new air emission standards for Portland Cement industry nationwide, lowering allowable emission limits and expanding the number of regulated constituents.
 - ✓ Limits established for Mercury and Total Hydrocarbons
 - ✓ Limits lowered for Particulate Matter — a surrogate for heavy metals other than mercury
2. Lehigh invested more than \$6 million in enhanced emission controls at its Glens Falls plant to ensure compliance with new standards and achieve EPA's designated Maximum Achievable Control Technology (MACT).
3. New standards reflected in Lehigh's current air emissions permit.

Current Air Emission Standards

In July 2018 ...

1. USEPA completed a re-evaluation of the MACT standards for the industry, including public health risks, as required every eight years.
2. Re-evaluation consisted of extensive air dispersion modeling and health risk assessments based on data from all Portland cement plants in the country.
3. USEPA concluded that “...*the standards provide an ample margin of safety to protect public health, and that it is not necessary to set a more stringent standard to prevent an adverse environmental effect.*”

Continuous Monitoring for Emissions

- **Lehigh has continuous monitoring for the following emissions:**
 - ✓ Mercury
 - ✓ THC or total hydrocarbons
 - ✓ Dioxins/Furans
 - ✓ Particulate Matter
 - ✓ NO_x
 - ✓ Opacity
 - ✓ CO₂
- Data is measured five times per minute and averaged every minute.
- Daily, weekly, monthly, quarterly and/or annual quality assurance activities required to ensure accuracy of monitors, with results submitted to regulatory agencies
- Preventative maintenance is performed on scheduled basis.
- Alarm notifications and alerts in Main Control Room should any problem with analyzer occur.

Stack Testing

- **A third-party environmental monitoring firm performs the following stack testing:**
 - ✓ Annual performance test of Particulate Matter
 - ✓ Annual performance test for SO₂
 - ✓ Dioxin/Furan performance test every 30 months
 - ✓ Annual Relative Accuracy Test Audit (RATA) for THC, Mercury, Nox and CO₂

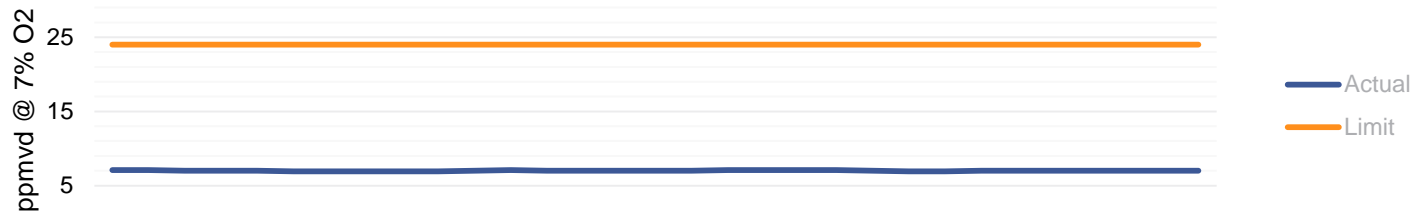
- **NYSDEC Oversees & Reviews Results**
 - ✓ NYSDEC approves testing protocol.
 - ✓ NYSDEC is on-site to witness the testing.
 - ✓ Stack testing results that have been verified for quality assurance are submitted to regulatory agencies within 60 days.

Emissions Data – Internal & External Reviews

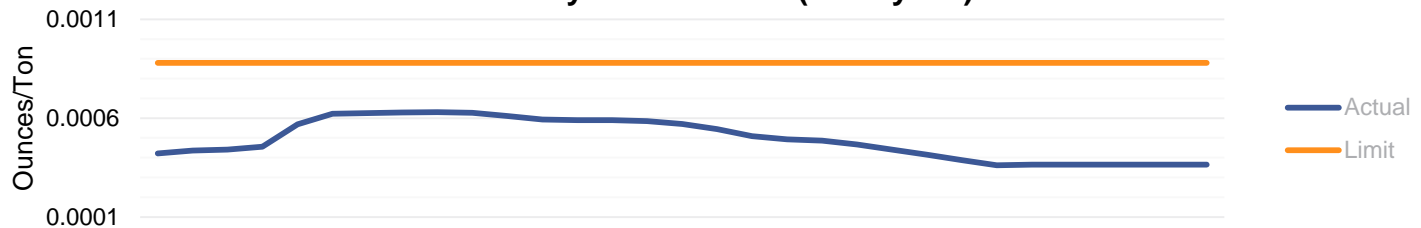
- Emissions data is reviewed for compliance daily at morning Production Meeting.
- Plant level data is submitted to Corporate leaders semi-monthly.
- Data reports are submitted to NYSDEC and EPA Region 2 on required schedules.

Emissions Control Performance — December 2018

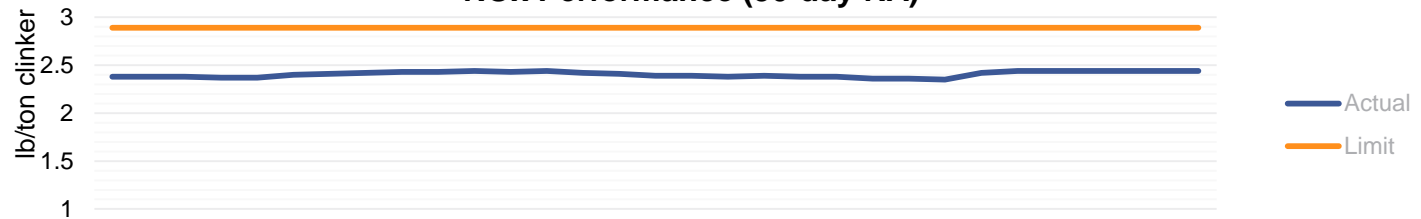
**Glens Falls - Kiln
THC Performance (30-day RA)**



**Glens Falls - Kiln
Mercury Performance (30-day RA)**



**Glens Falls - Kiln
NOx Performance (30-day RA)**



Why Alternative Fuels?

- Lehigh's parent companies view alternative fuels as an essential component in reducing fossil fuel use and our carbon footprint, and has established a goal of reaching 30% alternative fuel use globally by 2030.
- Lehigh is currently using engineered fuels similar to that proposed for Glens Falls at four plants in the U.S. and Canada — in some instances in greater volumes and with higher plastic content.
- Air emissions at these plants are below applicable emission limits.



HeidelbergCement has established "Sustainability Commitments 2030"

Why Alternative Fuels at Glens Falls?

- Reduces fossil fuel consumption, contributing to parent's company's Sustainability 2030 goal.
- Reduces fuel costs, which account for 25% of total operating costs in Glens Falls.
- Added benefit: Keeps a non-recyclable material out of landfills

All while keeping air emissions well below currently allowable limits.



***Our employees are working hard to keep us competitive in a global market.
Alternative fuels will reduce fuel cost, which help to keep us sustainable.***

What is Our Alternative Fuel?

A 60/40% mix of plastic trimmings and cardboard fiber from recycled paper mills:

- Corrugated cardboard boxes from homes and businesses arrive at recycled paper mills in flattened, compacted bales.
- Bales go into a pulper where water breaks the cardboard back down into fibers that will be recycled into new cardboard.
- A chain-like rope is run through the pulper to remove the baling wire and any plastic-based labels, tapes, wrappings that were on the boxes.
- The materials and some fiber wrap around the rope, forming what is called “raggertail.”
- The rope is pulled from the pulper and the raggertail is sent to Lehigh’s supplier, Frontier Fibers, where it is processed through screen shredders, magnets, and an eddy current to remove both ferrous and non-ferrous metals, before being shipped to Lehigh as an engineered fuel. Without a market, this material would be landfilled.

How Will Lehigh Use The Fuel?

- Material will arrive by truck in a compacted form (no baling or wrapping) and be fed directly from the truck into a feed hopper and then into a pipeline, at a controlled rate, into the kiln.
- Lehigh proposes to use raggertail as a maximum of 15% of our fuel mix.
- It will always be combined with coal and/or natural gas, which will make up 85% of our fuel mix.
- Each delivery will be sampled for a variety of constituents as required by DEC.



Preparing For Our Permit Application

2016:

- Lehigh obtained a Beneficial Use Determination for raggertail from NYSDEC, allowing for emissions testing to determine if material could be used as fuel source while keeping emissions below currently allowable levels.

2017:

- Lehigh purchased and installed alternative fuel handling system to conduct air emissions testing.
- Lehigh retained third-party environmental testing firm to conduct air emissions tests using alternative fuel.
- Testing protocols were approved in advance by NYSDEC, and NYSDEC was on-site to observe all testing.
- Testing was conducted using blend of alternative fuel and coal to demonstrate compliance with existing limits and conclude no changes needed.

Emissions Testing Results

- Lehigh tested for those constituents included in its New York State air permit.

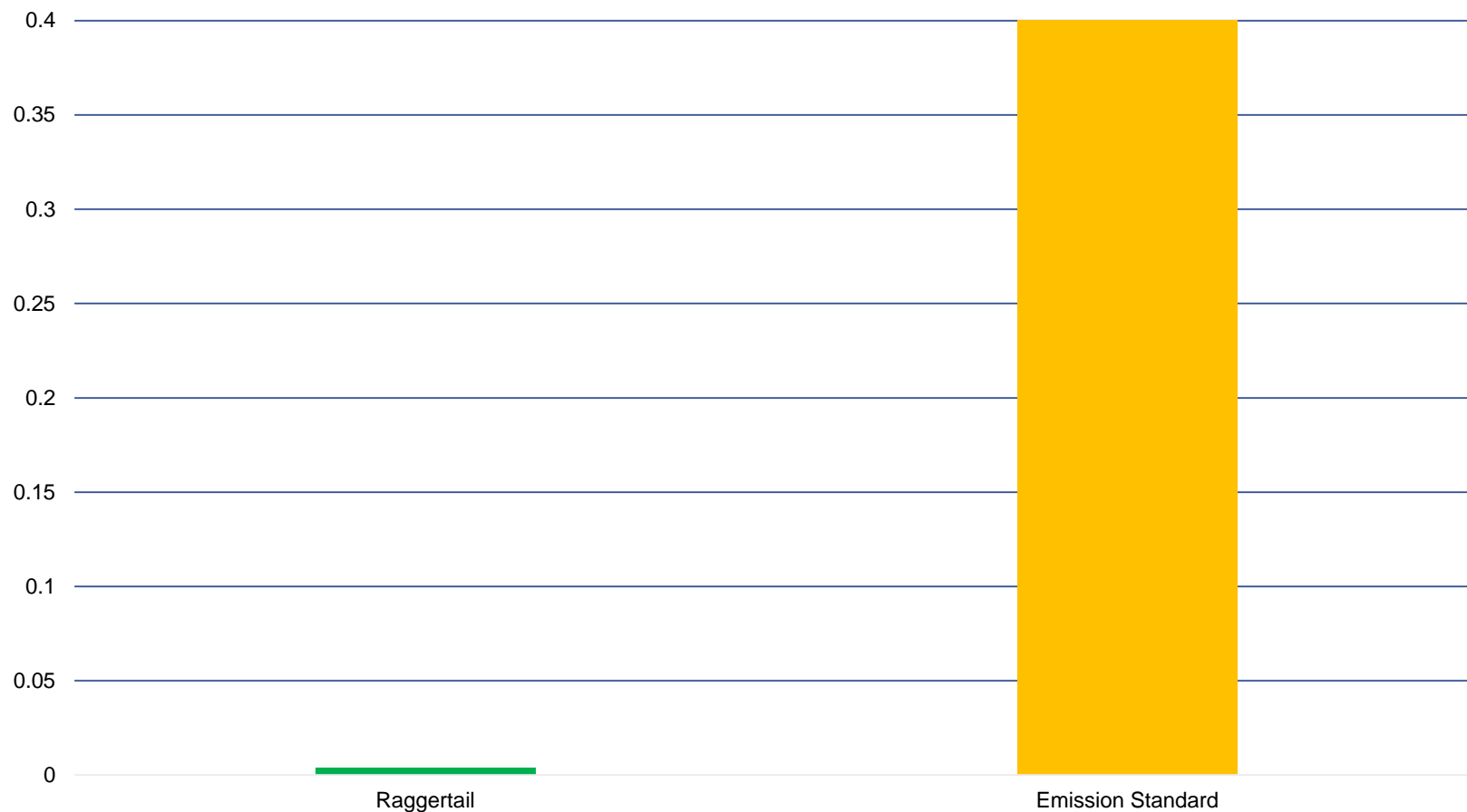
All of Lehigh's regulated air emissions were well below the plant's current permitted levels.

- Lehigh also tested for materials regulated under Part 212 of NYS law (e.g., metals) that “have the potential to be emitted” from our processes.

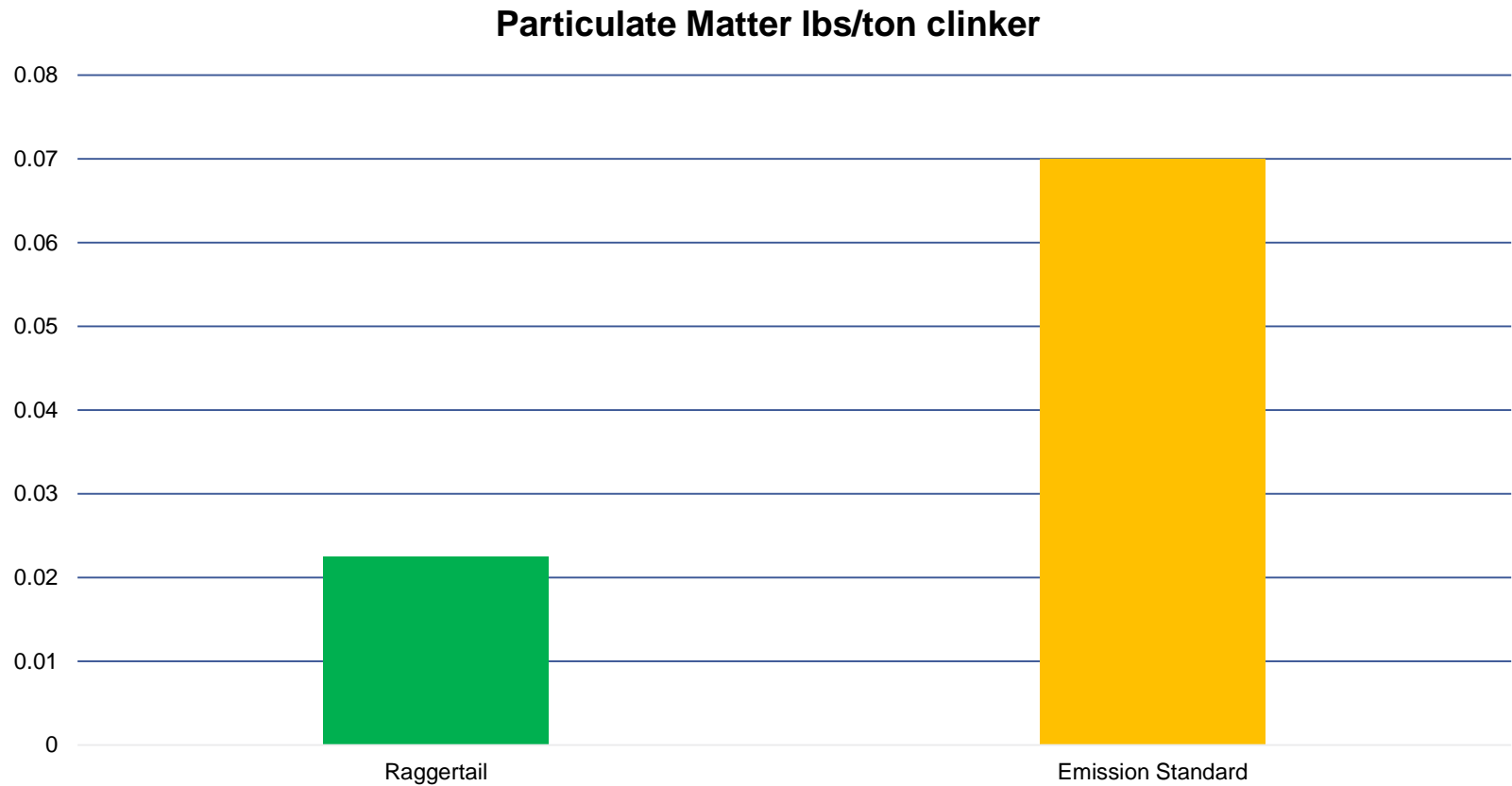
All materials detected were below state emissions guidelines. Those same constituents were also detected during testing without raggertail — again, all within state guidelines.

Air Emissions Comparison

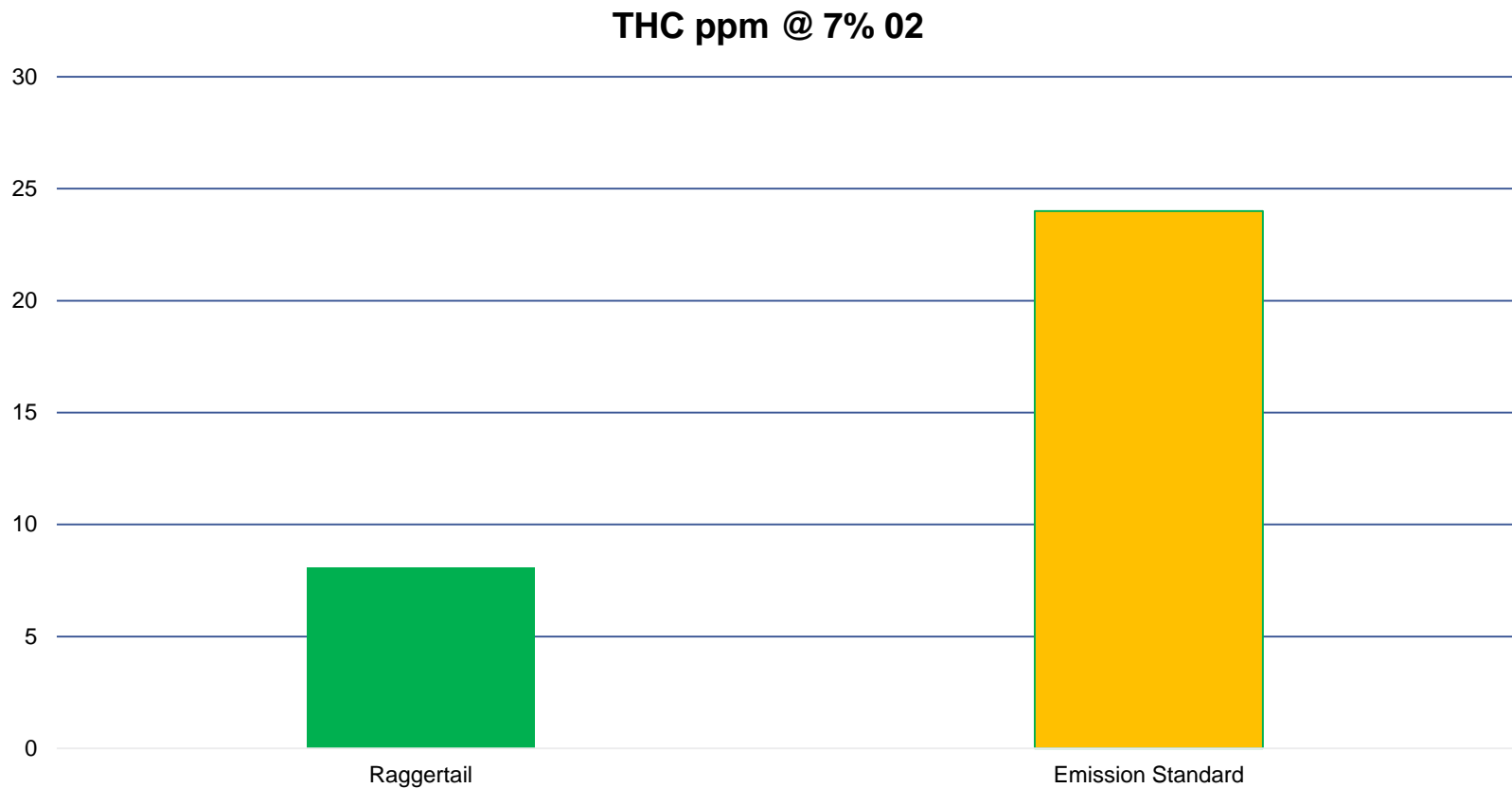
Dioxins / Furans ng/dscm @7% O₂



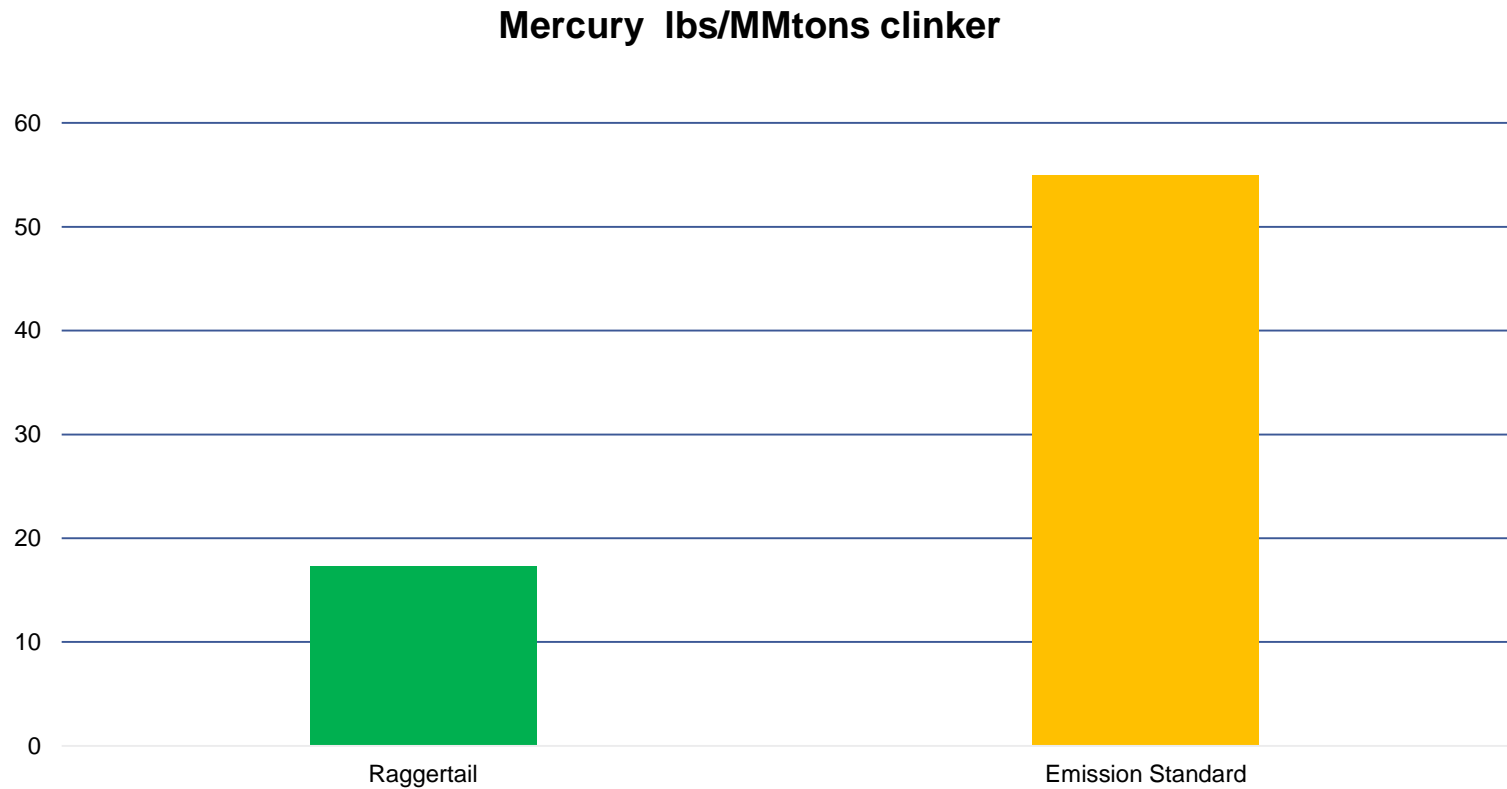
Air Emissions Comparison



Air Emissions Comparison



Air Emissions Comparison



Draft Permit Issued

- Lehigh submitted the test results and its permit modification application to NYSDEC.
- Application does not ask for any increase in our currently allowable air emission limits.
- NYSDEC concluded use of raggertail “will not cause ambient impacts above State guideline concentrations,” and issued our draft permit.
- Public Comment Period runs through March 15, 2019

Thank you for your time!

